

# 3 Testing Medicines: A Clinical Trial



**C**ollecting evidence is an important part of science. One way to collect evidence is to conduct experiments as Dr. Goldberger did. Products such as medicines are tested by volunteers before they are made available to the public. These tests are known as **clinical trials**.

## A CLINICAL TRIAL

Imagine that you suffer from severe headaches several times a month. These headaches are so painful that you can't read, listen to music, or watch television. Regular headache medicines don't work very well for you. One day, you complain to your doctor about your headaches. She tells you that the local medical school is conducting clinical trials of a new headache medicine. She asks if you would like to volunteer to be a part of this trial. Hoping for relief, you say yes.

Since medicines cannot be tested in the classroom, you will participate in a simulation of a clinical trial. In this simulation, differences in taste will equal differences in response to the medicine. Figure 1, "Clinical Trial of A Headache Medicine," on the next page, explains this simulation.



**How are medicines tested during a clinical trial?**



### Activity 3 • Testing Medicines: A Clinical Trial

Figure 1: Clinical Trial of A Headache Medicine



*The taste of the yellow lemon drink represents a headache.*



*The taste of the pink lemon drink represents the medicine taken to treat your headache.*



*If the pink lemon drink tastes the same as the yellow, there is no change in your headache.*



*If the pink lemon drink tastes better than the yellow, your headache is gone!*



*If the pink lemon drink tastes worse than the yellow, your headache is gone, but you experience side effects.*

## MATERIALS



*For each group of four students*

- 4 small tasting cups (one for each student)
- 1 sample cup of yellow lemon drink
- 1 sample cup of pink lemon drink



*For each student*

- 1 Student Sheet 3.1, “Analysis of Clinical Trial”



## SAFETY

Never taste materials or eat or drink in science class unless specifically told to do so by your teacher. Be sure that your work area is clean and free of any materials not needed for this activity. If you are allergic to lemons or other citrus fruits, juice drinks, or sugar, or if you have any other health issue, such as diabetes, that limits what you can eat, tell your teacher and do not taste the drink samples in this activity.

## PROCEDURE

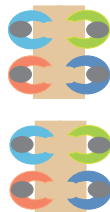
1. Record your group number (found on the sample cups) in your science notebook; this represents the batch of medicine you received.
2. Fill your tasting cup half-full of yellow lemon drink by carefully pouring from the sample cup into your tasting cup.
3. Taste the yellow lemon drink. Empty the cup.
4. Fill your tasting cup half-full of pink lemon drink.
5. Taste the pink lemon drink.
6. *Did the pink lemon drink taste the same, better, or worse than the yellow lemon drink?* Record your response in a table like Table 1 on the next page.



Table 1: Results of Treatment				
		Same as yellow lemon drink	Better than yellow lemon drink	Worse than yellow lemon drink
My response (Show with an X)				
My group's response (Show number of each)				

7. Share your results with your group. Summarize your group results in Row 2 of your data table.
8. Have one person from your group report your group's results to your teacher.
9. After a class discussion of the results, record the class's results and create a bar graph of the class's data on Student Sheet 3.1, "Analysis of Clinical Trial."

## ANALYSIS



1. What evidence do you have that the medicine does or does not work to improve headaches?
2. **a.** What is a placebo?  
**b.** Why is a placebo group included in clinical trials?



**3.** In this activity, if a person finds that the drink tastes worse, the headache is gone, but there are side effects.

**a.** Assume that the side effects are mild, such as a slight stomachache. Explain why this medicine should or should not be sold to people suffering from a headache. Are there any trade-offs involved in your decision?

**b.** What if the side effects were serious, such as nausea and vomiting? Explain why this medicine should or should not be sold to people suffering from a headache. Are there any trade-offs involved in your decision?



**4.** In this activity, if a person finds that the medicine tastes better or worse, the headache is gone. Review the results of this simulation. Think about whether the medicine works and how often side effects occur. What would you conclude about the safety and effectiveness of this medicine for treating headaches? Support your conclusion with evidence.

## EXTENSION



Go to the SALI page of the SEPUP website to find out how to post your class results on the site. Look at the results posted by other students. How do your results compare?